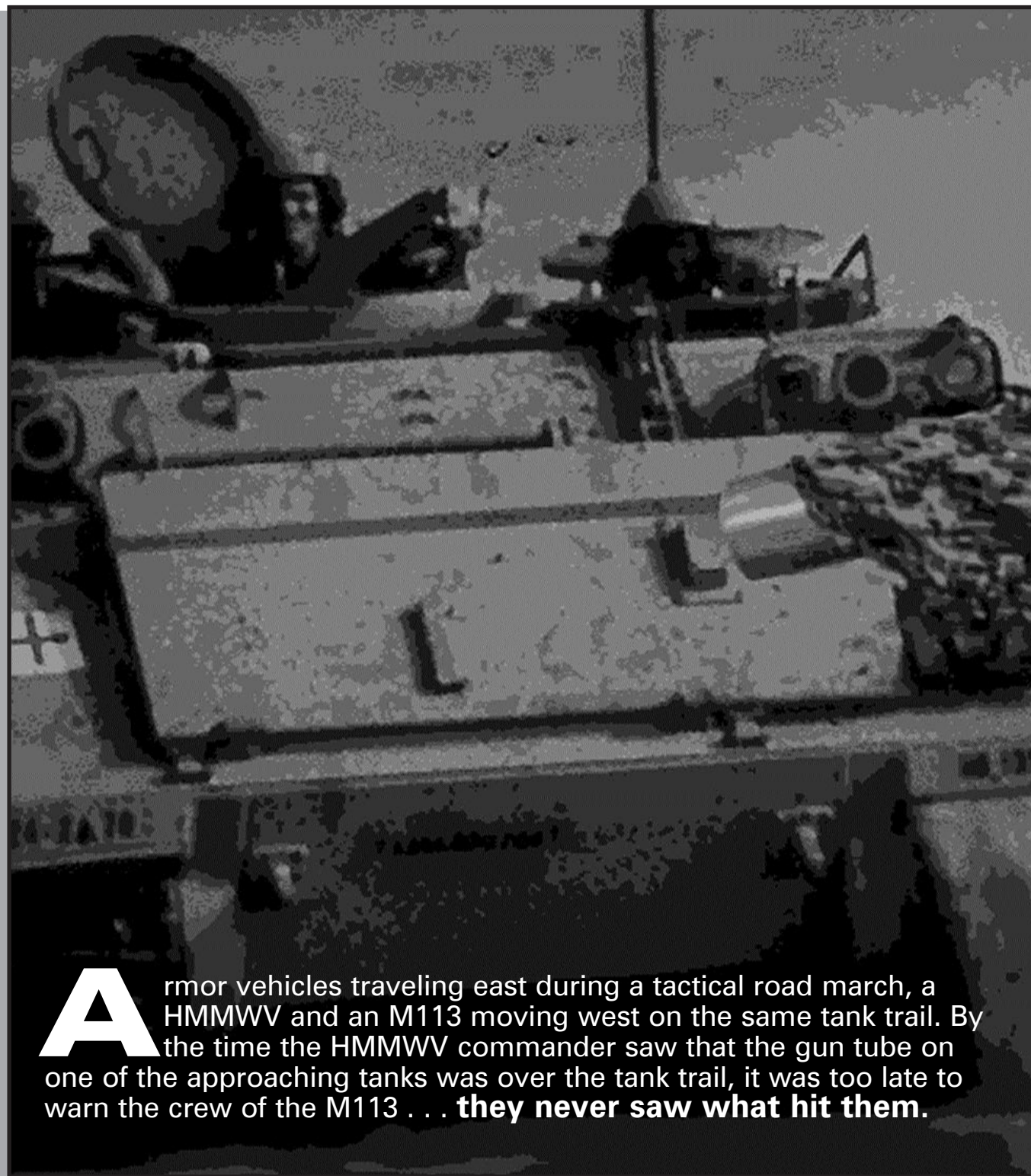


# ARMY GROUND-ACCIDENT REPORT **COUNTERMEASURE**

Volume 18 Number 4

April 1997



**A**rmor vehicles traveling east during a tactical road march, a HMMWV and an M113 moving west on the same tank trail. By the time the HMMWV commander saw that the gun tube on one of the approaching tanks was over the tank trail, it was too late to warn the crew of the M113 . . . **they never saw what hit them.**

# Risk management could have made a difference

**D**uring a night tactical operation, an armor platoon was displacing from a screening mission to their battle positions. An engineer element was moving from their assembly area to the tank platoon's vacated position to emplace a minefield. The two elements met on the same tank trail, resulting in an accident and a fatality.

The armor platoon was composed of three M1A1 tanks and an M2 Bradley fighting vehicle (BFV). The engineer element consisted of an M998 HMMWV and an M113 armored personnel carrier.

The events leading to the accident were set in motion between 0530 and 0630 when the armor platoon received the order to displace from the screening mission to their battle positions. The platoon began moving south and then

turned east, traveling at 10 to 15 MPH on the tank trail. The lead tank and the M2 had their turrets oriented to the east. The tanks in the third and fourth positions had their turrets oriented to the north, observing enemy targets as they were leaving their screening mission.

The engineer element had been given a counter mobility mission in the sector that the armor platoon was vacating. The engineer element was heading west on the tank trail with the HMMWV leading the M113.

## The engineer vehicles

The vehicle commander of the HMMWV identified the armor platoon through his AN/PVS7B night vision goggles, but then he put the goggles down around his neck. (He was using the PVS7Bs in the

binocular mode.) As his vehicle closed with the third armored vehicle, the HMMWV commander noticed that something looked out of the ordinary. Looking through his NVGs, he saw that the approaching M1A1's gun tube was over the tank trail. He immediately told his driver to turn hard right, but there wasn't enough time for him to warn the M113 crew. The tank's gun tube struck the top of the HMMWV before striking the M113, tearing off the M113 driver's and track commander's hatches. The M113 driver was killed. Neither the M113 driver nor the track commander was wearing or using any type of night vision device. They never saw the M1A1's



The M113 driver was killed when the M1A1's gun tube struck his vehicle, tearing off the driver's hatch

gun tube.

As the M113 went off the tank trail, it hit the right rear of the HMMWV, which had pulled over and stopped. After leaving the tank trail, the M113 traveled about 783 feet before the track commander was able to pull the emergency fuel cut-off switch.

### The armor vehicles

The only communication from the armor element that there were approaching vehicles on the tank trail was a call over the platoon net by the crew of the M2. Neither the driver, gunner, nor tank commander of the M1A1 that was involved in the accident recalls hearing the radio transmission from the M2 crew. The crew of the trail M1A1 did hear the radio transmission, and they rotated their tank's turret to the rear.

The driver of the accident M1A1 saw the oncoming HMMWV and M113 approximately 5 seconds before they passed each other. The driver announced "Humvee/PC" over the intercom. But the communication from the driver was

not precise, and the tank commander did not realize what the driver was talking about. The tank commander thought the driver was referring to targets that he had been observing through his sight.

The tank commander and crew of the accident vehicle never realized that they had hit another vehicle. The tank commander thought that they had inadvertently scanned too far to the rear, engaging the back deck clearance switch.

The armor platoon was unaware that anything had happened, and they continued on their mission.

### Hazards/controls

Had the engineer element gone through the risk-management process by identifying the hazard—moving at night during a tactical road march—and identifying controls to assist in the movement—using night vision devices to aid in seeing—perhaps this accident would not have occurred or at least they would have had some time to react.

—LTC Pete Simmons, Chief, Systems Division, DSN 558-2926 (334-255-2926)

## GROUND CLASS A ACCIDENT

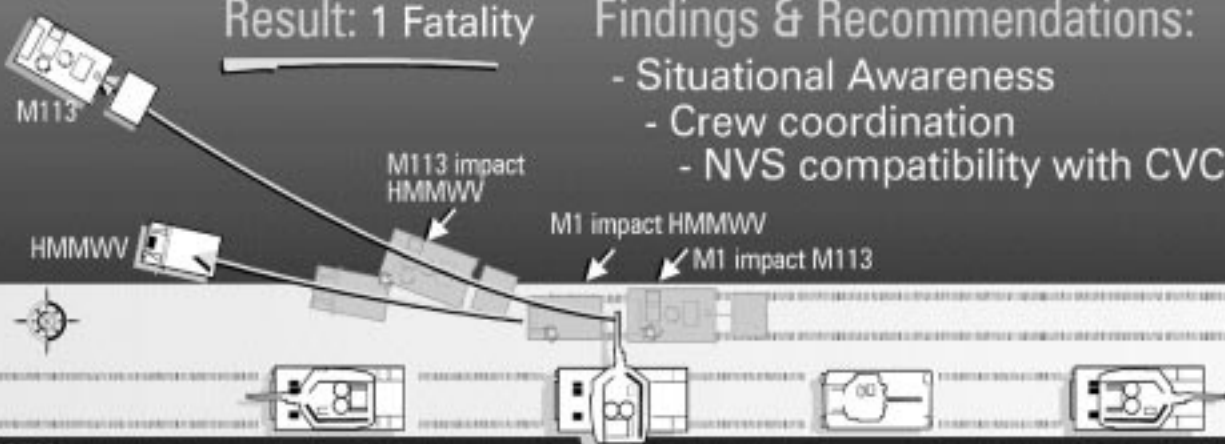
**Mission:** Armor unit repositioning from screening mission to battle position. Engineer unit conducting countermobility operations.

**Summary:** Armor unit traveling east along tank trail at night passed Engineer unit traveling in opposite direction. While continuing to track enemy elements, an M1A1 gun tube struck passing HMMWV & M113 causing fatal injuries.

Result: 1 Fatality

Findings & Recommendations:

- Situational Awareness
- Crew coordination
- NVS compatibility with CVC



IPR7-126

# CO<sub>2</sub> fire extinguishers in Army weapon systems

## Background

Over the last two decades, national and international legislation has been enacted, limiting the production and use of ozone-depleting chemicals (ODCs). The *Montreal Protocol on Substances that Deplete the Ozone Layer* is an international agreement signed by representatives from the United States and 120 other nations. Originally signed in 1987 and amended in 1990 and 1992, it established phase-out schedules for the production of the chemicals that pose the most serious threat to the ozone in the upper atmosphere, identified as Class I ODCs.

The Clean Air Act Amendment signed by President Bush in 1990 codified the production phase-out schedules of the Montreal Protocol and also set restrictions on both the purchase of ODCs and the servicing of equipment that uses ODCs. Additional laws and federal regulations have also been enacted in the past several years that have focused on the sale, import, and storage of Class I ODCs.

Of special note is the National Defense Authorization Act of Fiscal Year 1993 (Public Law 102-484). Section 326 expressly prohibits the Department of Defense from letting any contract that requires the use of a Class I ODC. This law effectively barred the Army from purchasing any equipment that used ODCs, unless the Army could technically certify that there was no known or economically feasible non-ODC alternative.

One ODC of particular interest is halon 1301, a miracle chemical that actually inhibits the chemical process that initiates a fire. An unparalleled fire-fighting agent discovered through Army research, it was incorporated throughout Army weapon systems and facilities in the 1970s and 1980s. On Army installations it

is typically used in fire-suppression systems protecting critical equipment such as computers, telecommunication equipment, and flight simulators. Halon 1301 fire-protection systems are also built into numerous Army weapon systems to suppress engine fires and crew compartment explosions in aircraft, armor, and watercraft.

## The problem

The domestic production of halon 1301 ended on 31 December 1993 as a result of the Clean Air Act. As supplies have diminished, the price of halon 1301 has increased from less than \$1 a pound to over \$40 a pound. The Army has therefore identified the continued dependency on halon 1301 as a threat to Army readiness and quality of life.

## The impact

The Army also uses halon 1301 in a 2.75-pound hand-held fire

extinguisher. This extinguisher is fielded in a variety of Army aircraft (Apache, Black Hawk, Chinook, and Kiowa), command and communication shelters, and ground combat vehicles (Abrams, Bradley, Paladin, Fox, FAASV, Sheridan, and MLRS).

## The alternative

Tests run by the Army Test Center and the Army Surgeon General have identified carbon dioxide (CO<sub>2</sub>) as an acceptable alternative to halon 1301 in this application. Therefore, the Army is currently undertaking a program to replace the halon extinguishers in all applications with CO<sub>2</sub> extinguishers.

## The exception

One exception is in the M1 Abrams main battle

**CO<sub>2</sub> smothers a fire instead of chemically suppressing it . . . caution must always be exercised in using this agent.**

tank. CO<sub>2</sub> smothers a fire instead of chemically suppressing it, and so caution must always be exercised in using this agent. Since with certain turret positions the driver of the M1 cannot egress the vehicle, and the driver's position is the lowest crew position (CO<sub>2</sub> is heavier than air), a risk of asphyxiation exists if two CO<sub>2</sub> extinguishers are discharged into the driver's position at the same time.

On 24 Dec 96, the Program Manager (PM) for Abrams issued a Safety-of-Use Message (SOU) (241624Z Dec 96, TACOM-WRN Control No. 97-02) that stated the use of CO<sub>2</sub> hand-held fire extinguishers is not authorized for Abrams tanks. It further stated that any Abrams tank with CO<sub>2</sub> fire extinguishers installed was to be considered as deadlined. Halon 1301 fire extinguishers were to be requisitioned and reinstalled before the tanks were considered mission capable.

A 7 Jan 97 SOU (072115Z Jan 97, TACOM-WRN Control No. 97-03) issued by the PM-Abrams reiterated the prohibition on the use of CO<sub>2</sub> hand-held fire extinguishers in M1 tanks because halon 1301 fire extinguishers were not being replaced.

### **The dilemma**

Following these messages, the item managers for these fire extinguishers at the Defense Logistics Agency (DLA) and Tank-automotive and Armaments Command (TACOM) were overwhelmed with concerns from the field. It was learned that a significant number of Abrams tanks were equipped with CO<sub>2</sub> extinguishers and did not have immediate access to halon 1301 extinguishers. A serious situation developed, with immediate short-term and long-term consequences to unit readiness, if Abrams were to be deadlined until halon 1301 fire extinguishers were purchased, requisitioned, and reinstalled.

### **The resolution**

On 10 Jan 97, the PM-Abrams issued another SOU (102131Z Jan 97, TACOM-WRN Control No. 97-04) addressing these new readiness issues as well as the safety concerns. This SOU stated "... the use of CO<sub>2</sub> hand-held fire

extinguishers on Abrams tanks is approved as a temporary measure until all Abrams tanks can be equipped with the authorized halon 1301 hand-held fire extinguishers." In this SOU, the PM defined the specific conditions wherein CO<sub>2</sub> fire extinguishers could be safely stored and used on the M1 tank:

- A CO<sub>2</sub> extinguisher cannot be stored in the crew compartment of the tank.

- If a tank is to carry two CO<sub>2</sub> fire extinguishers, they must both be stored in the turret cargo rack box located near the commander.

- All crewmembers must evacuate the tank before a CO<sub>2</sub> fire extinguisher is discharged into the tank, and crewmembers must not reenter the tank to fight the fire.

If these conditions are met, then an Abrams tank with CO<sub>2</sub> fire extinguishers will be considered fully mission capable.

### **How do we get 1301 extinguishers?**

In order to expedite the change back to halon 1301 hand-held fire extinguishers, the 10 Jan 97 SOU identified several ways for obtaining these extinguishers:

- One option, since the Abrams is the only Army system that requires halon 1301 extinguishers, is to support Abrams' requirements with extinguishers from other vehicles at the same installation. The halon 1301 extinguishers in these vehicles are being replaced with CO<sub>2</sub> extinguishers.

- Another option being considered by TACOM is to conduct a swap-out program of halon 1301 and CO<sub>2</sub> fire extinguishers. This program will allow cross-leveling between installations and will redistribute serviceable halon 1301 hand-held fire extinguishers to M1 Abrams units.

- Finally, halon 1301 extinguishers may be acquired from DLA through the wholesale supply system by funded requisitions.

### **Point of contact**

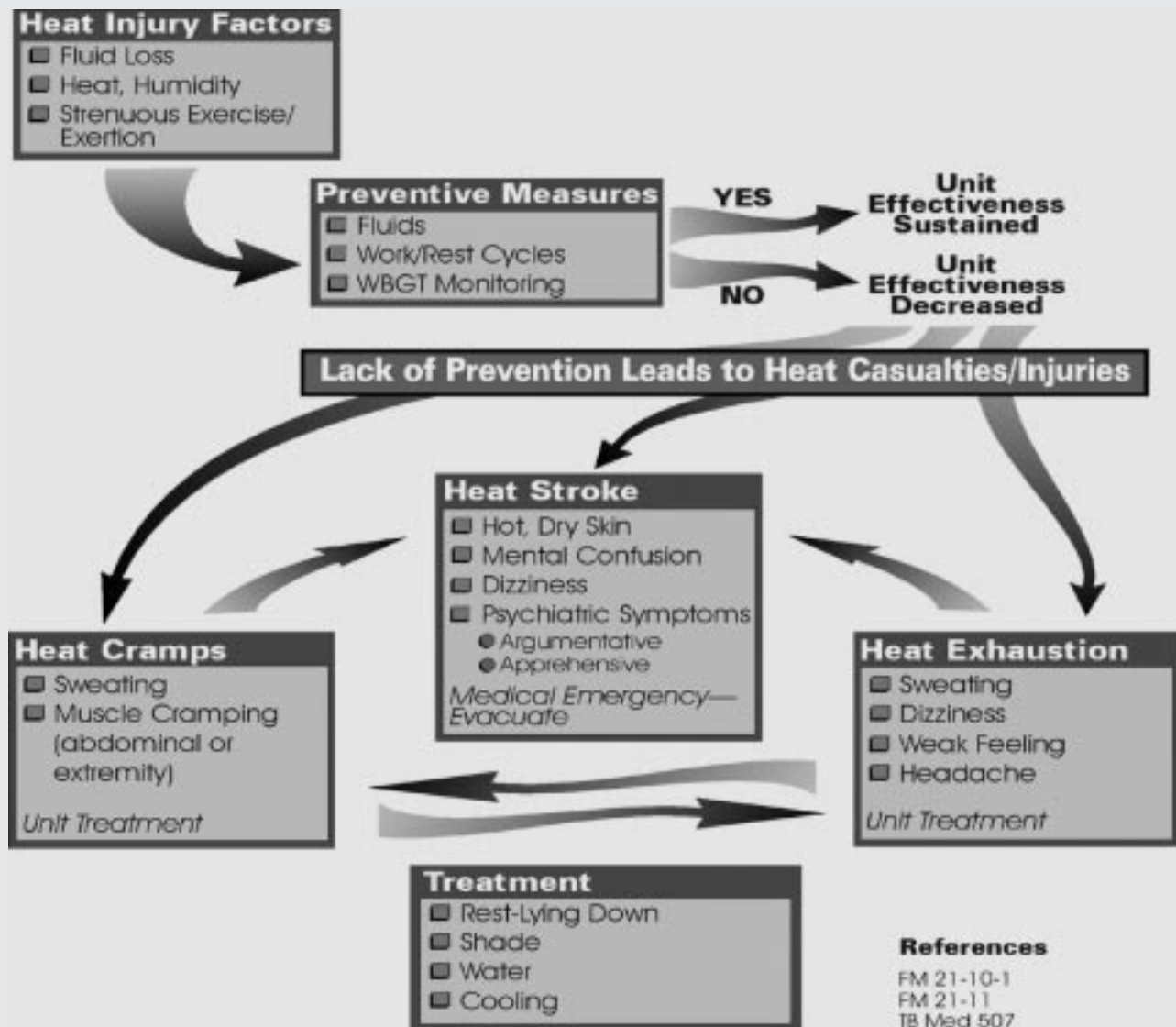
Mr. Jeff Conrad, Ocean City Research Corporation, 703-212-9006, e-mail [ocrc2@erols.com](mailto:ocrc2@erols.com).

—Mr. George H. Terrell, Army Acquisition Pollution Prevention Support Office, 703-617-9488

# Heat—number one summer health hazard

**H**ot weather is just around the corner. Before it gets here, you need to know how to prevent heat injuries, how to recognize signs and symptoms if they do occur, and the proper treatment. The diagram below shows that heat injuries do not necessarily follow a progression from heat cramps, heat exhaustion, to heat stroke. A soldier may experience heat stroke without having previous symptoms of heat cramps or heat exhaustion. The article "How the body handles heat" explains what happens within the body when soldiers are exposed to conditions of heat and humidity and stresses the importance of hydration. "Understanding and managing heat stress in NBC operations" discusses factors that contribute to performance degradation and heat casualties in soldiers wearing MOPP gear.

And don't forget that heat injuries aren't restricted to the operational Army. Practice prevention and be aware of the signs of heat injury when you're working in your yard this summer or when you and your friends or family take that long-awaited trip to the beach or lake.



# How the body handles heat

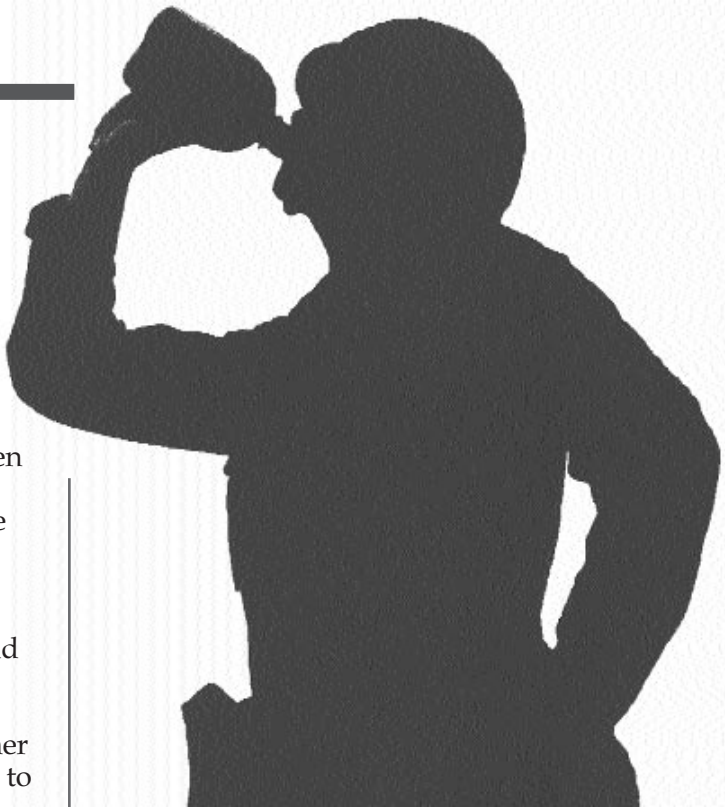
**T**he human body maintains a fairly constant internal temperature, even when it is exposed to varying environmental temperatures. To keep the internal body temperatures within safe limits, the body must get rid of its excess heat through the skin by convection and evaporation of sweat. The body automatically responds when the temperature of the blood exceeds 98.6°F, by increasing blood flow to the skin and sweating.

In this process of lowering internal body temperature, the heart begins to pump faster to increase blood flow and blood vessels to the skin expand to accommodate the increased flow. As more blood is directed to the skin, other blood vessels contract and blood flow to the internal organs and muscles is reduced. By circulating more of the blood to the skin's surface, heat is lost to the cooler environment, and the body cools down.

At the same time blood vessels expand and more blood flows to the skin, the brain signals the sweat glands in the skin to secrete sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating excess heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm or warmer than the skin, blood brought to the body surface cannot lose its heat through convection. Under these conditions, the heart continues to increase blood flow to the body surface, the sweat glands increase sweat production onto the surface of the skin, and evaporation of the sweat becomes the sole or principal means of cooling body temperatures.

But sweating does not cool unless the moisture is evaporated from the skin. Sweat dripping from the skin is wasted



in the cooling process. Under conditions of high humidity, the rate at which sweat evaporates from the skin decreases, and the body's efforts to cool itself may be significantly impaired. These conditions adversely affect an individual's ability to work in a hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs, strength declines, and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. In fact, mental performance can be affected with an increase in body temperature of only 2°F above normal. Workers who must perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

## Importance of hydration

Hydration is the most important element in prevention of heat injuries. Liquid used for sweat production comes from the blood plasma, not from cell tissues. Maintenance of fluids is essential for

both blood volume for blood flow and sweating. Both are reduced by dehydration. The dehydrated individual has less ability to maintain body temperature in the heat.

As soldiers become acclimated to hot weather, their bodies become more efficient at producing large volumes of sweat to cool the body faster. The body will also increase blood volume 10 to 25 percent to help compensate for the added fluid demands for more blood flow and sweat production. **The body does not learn to get along with less water**—rather it learns to use more as part of the natural acclimatization process and must have it for cooling.

Another thing that is often misunderstood is that when a person suffers from an illness that causes fever, they completely lose whatever acclimatization they have achieved. The body is back at zero, and the process of becoming acclimatized begins again.

By the time the body is stimulated to feel thirst, it is already 1 to 2 percent dehydrated, so soldiers can't depend upon feeling thirsty to tell them that they need fluids. A drinking discipline policy must be enforced to maintain adequate hydration.

**POC: MAJ Bob Wallace, Industrial Hygienist, DSN 558-1122 (334-255-1122), e-mail wallacer@safety-emh1.army.mil**

## Preventing Heat Injury

Developing controls for the hazard of conducting training and other physical activities during conditions of high temperatures and humidity are fairly simple. For example:

- Provide adequate water and ensure water breaks are taken every 15 to 30 minutes. Water should be cool (50° to 60°F). Thirst is not an adequate indicator of dehydration, soldiers should drink one-third more water than necessary to satisfy thirst. Water requirements must be increased to reduce heat stress.
- Schedule rest breaks.
- Use shaded areas: trees, buildings, tents to reduce radiant heating. The temperature in the sun and under the canopy of a tree can vary from 8 to 20 degrees.
- Schedule activities as early in the morning or as late in the afternoon as possible.
- Schedule heavy work for the cooler part of the day. The body generates more heat when heavy work is being performed than during light or moderate work activities.
- Consider weather, workload, protective equipment—such as MOPP gear—when scheduling activities.
- Monitor weather conditions so a heat stress index can be evaluated. The danger of heat stress increases with higher temperatures and humidity and with direct sunlight. The heating effect of the sun (without clouds) can add as much as 13°F to the apparent temperature that soldiers are exposed to. Wind reduces the risk of heat illness by increasing the evaporation of sweat when normal clothing is worn.
- Encourage use of sun screens, ultraviolet rays penetrate most clothing. Desert BDUs are designed to provide an extra layer of fabric to prevent penetration of the sun's rays on soldiers' backs.
- Use mechanical aids whenever possible or spread tasks between several soldiers to reduce the stress on individuals.
- Monitor soldiers and encourage them to monitor each other for signs of heat stress. *Be prepared to provide medical assistance.*

# Managing heat stress in NBC operations

Once an accurate assessment of the NBC threat has been made, the key to selecting an appropriate Mission-Oriented Protective Posture (MOPP) level lies in understanding the factors that contribute to performance degradation and heat casualties.

MOPP4 protects soldiers by completely isolating them from the NBC environment. Once leaders understand the potential problems associated with heat stress in MOPP they will be better prepared to carry out the MOPP analysis.

## Heat stress in MOPP

Body temperature must be maintained within narrow limits for optimum physical and mental performance. The body produces more heat during work than rest. Normally, the body cools itself by evaporation of sweat and radiation of the heat at the skin's surface. MOPP gear restricts these heat loss mechanisms because of its high insulation and low permeability to water vapor. In addition, physical work tasks require more effort when soldiers wear protective clothing because of added weight and the restriction of movement. This results in more body heat to be dissipated than normal and body temperature tends to rise quickly. The amount of heat accumulated depends upon the amount of physical activity, the level of hydration, the clothing worn, the load carried, the state of acclimation, physical fitness and fatigue, as well as the terrain and climatic conditions.

Adjusting the MOPP level by opening the Battle Dress Overgarment (BDO) jacket, unblousing boots, and rolling up the hood will reduce barriers to body cooling. The decision process for selecting appropriate adjustments is covered under MOPP analyses, FM 3-4: *NBC Protection*, May 92.

Work intensity is a major contributing factor to heat stress and can be managed by leaders. Military work can be categorized as very light, light, moderate, or heavy. Table 2-1, FM 3-4, provides examples that can be used as a guide in estimating the work intensity for a particular mission or task. The incidence of heat casualties can be reduced if soldiers can be allowed to lower their work intensity and/or take more frequent breaks. Tables 2-2 and 2-7 provide information necessary to calculate recommended work/rest cycles for various environmental conditions, clothing levels, and work intensities during daylight and night (or fully shaded) operations. The work/rest cycles specified in the tables are based on keeping the risk of heat casualties below 5 percent. Under some operational conditions, work/rest cycles offer no advantage to continuous work (see NL entries in tables 2-2 and 2-7). There are conditions when work/rest cycles offer no advantage; for example, when the environmental and clothing conditions



do not permit any cooling during rest (see NA entries in tables 2-2 and 2-7), leaders may choose to use the estimated tolerance times such as maximum continuous work times specified in tables 2-4 (daylight) and 2-9 (night or shade) to limit the risk of heat casualties to less than 5 percent.

Although strict adherence to work/rest criteria is possible during training exercises, this may not be possible during combat operations. Tables 2-4 and 2-9 provide guidance on tolerance times; for example, the maximum number of minutes of work before the risk of becoming a casualty exceeds 5 percent (1 of every 20 soldiers). These estimates, representing average expected values within a large population, should be considered *approximate guidance* and are not to be used as a substitute for common sense or experience. Individuals will vary in their tolerance. Once the work time limit has been reached, soldiers should rest in the shade according to guidance provided in table 2-6 before returning to work. As table 2-6 clearly shows, reduction of MOPP level during the rest period is the key to maximizing the time soldiers can spend performing work.

In minimizing heat stress, work/rest schedules may be supplemented by microclimate cooling (MCC) systems in which an air- or liquid-cooled vest is worn under the BDO to remove body heat from the skin. MCC systems are available inside certain combat vehicles, but MCC options are not usually available for dismounted soldiers.

Even when work/rest schedules and MCC are used, an increased risk of performance degradation and heat casualties is inevitable when wearing MOPP in hot weather.

## Dehydration

Because of higher body temperatures, soldiers in MOPP gear sweat considerably more than usual, often more than 1.5 quarts of water every hour during work periods. Water must be consumed to replace lost fluids or dehydration will follow. Even a slight degree of dehydration impairs the body's ability to regulate its temperature and nullifies the benefits of heat acclimatization and physical fitness, increases the susceptibility to heat injury, and reduces work capacity (including G-tolerance in pilots), appetite, and alertness. Even in soldiers who are not heat casualties, the combined effects of dehydration, restricted heat loss from the body, and increased workplace effort place a severe strain on the body's functions, and soldiers suffer from decrements in mental and physical performance.

The difficulty of drinking in MOPP increases the likelihood of dehydration. Thirst is not an adequate indicator of dehydration; soldiers will not sense when they are dehydrated and will fail to replace body water losses, even when drinking water is readily available. Unit chain of command must take responsibility for enforcing regular and timely fluid replacement in their soldiers.

Water requirements should be estimated using the guidelines provided in tables 2-3, 2-5, 2-8, and 2-10. Base the recommended hourly replenishment on current work intensity, temperature, clothing layers, and light cycle. For example, at a moderate work intensity in MOPP4 (over underwear only) and a daylight wet bulb globe temperature (WBGT) of 80°F (27°C) a soldier should drink approximately 2 quarts of water per hour if working continuously or 1 quart per hour if working according to the work/rest schedule recommended in table 2-2 (for example, 10 minutes work, 50 minutes rest).

Soldiers should drink as much as possible before donning the mask, and frequent drinking while working is more effective in maintaining hydration than waiting for rest periods to drink.

## Training and conditioning

Well-prepared soldiers suffer less stress when in MOPP4 than do soldiers who are less prepared. Well-prepared soldiers are those who are in good physical condition and have trained extensively in protective gear. Physically fit soldiers are more resistant to physical and mental fatigue and acclimatize more quickly to climatic heat or to heat associated with MOPP wear than less fit soldiers.

Units that anticipate deployment to regions where employment of chemical/biological agents is possible should augment physical training programs and increase their state of heat acclimatization. To optimize heat acclimatization, soldiers should progressively increase the duration (reaching 2 to 4 hours) and intensity in the heat over 7 to 14 consecutive days.

Finally, when soldiers are required to routinely work in MOPP gear, it is important to practice good hygiene; keeping skin clean to avoid developing heat rash that can dramatically reduce the ability to regulate body temperature.

**POC: SFC(P) William R. Gunter, Ground Branch, USASC, DSN 255-2913 (334-255-2913), e-mail [Gunterw@safety-emh1.army.mil](mailto:Gunterw@safety-emh1.army.mil)**

# Sunburn: A painful experience

**A**sk anybody who has fallen asleep in the sun what exposure to ultraviolet rays can do to the human body. A weekend at the lake or on the beach and a serious sunburn can send you to sick call and even a stay in the hospital.

If you think that using sun block, wearing protective clothing, and limiting exposure means you won't suffer any damage from the sun, think again. Use of

sunblock might enable you to spend the day in the sun without burning or blistering, but effects of exposure to the sun are cumulative. You could be setting a time bomb for the future. Sunblock products also vary, so be sure you read the label and select the one that gives you the most protection.

Maybe you think wearing long sleeves will protect you from the sun. No doubt that's better than exposing your bare skin to the sun's rays, but lightweight summer shirts have a sun-protection factor (SPF) of 7 or 8; when wet, it's even less. (Dermatologists recommend a minimum SPF of 15 for clothing.) So use sunblock in addition to the long sleeves.

The best way to

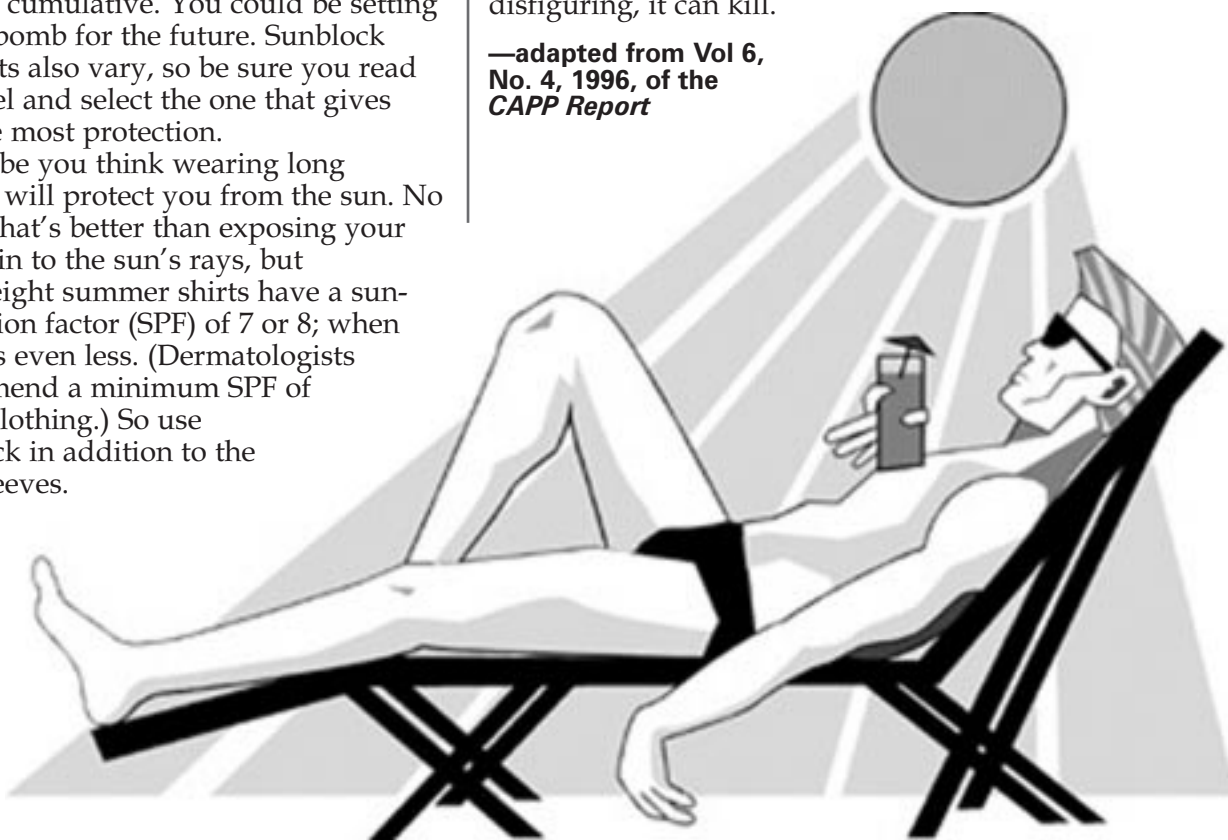
protect yourself from exposure to the sun is to avoid the hottest hours of the day. Next best is to provide barriers between your skin and the sun. The best barriers

are those that restrict exposure completely: awnings, umbrellas, roofs, and other structures. Even if you're under a barrier such as an umbrella, sunblock and protective clothing will help shield you from the effects of the sun and its reflection on sand and water.

Exposure to the sun can be a painful experience now, but its long-term effects of wrinkling and skin cancer can be not only disfiguring, it can kill.

—adapted from Vol 6, No. 4, 1996, of the *CAPP Report*

**The best way to protect yourself from exposure to the sun is to avoid the hottest hours of the day.**



# Safety messages

**F**ollowing are ground precautionary messages (GPM) issued during 1st Quarter FY 97 and not previously published in *Countermeasure*.

## Armament and Chemical Acquisition and Logistics Activity (ACALA)

■ AMSTA-AC-ASI-R, 011342Z Oct 96, subject: GPM ACALA No. 97-01, 5.56mm M4A1 grenade launcher.

■ AMSTA-AC-ASI-R, 051413Z Nov 96, subject: GPM ACALA 97-03, 5.56mm M4A1 carbine.

Following are safety-of-use messages (SOU) and maintenance advisory messages (MAM) issued during 2d Quarter FY 97.

## Aviation and Troop Command (ATCOM)

■ AMSAT-R-X, 102048Z Jan 97, subject: Safety-of-Use Message (SOU) ATCOM-97-02, operational, aircraft refueling nozzles manufactured by Carter Ground Fueling Company, closed-circuit refueling (CCR) nozzle assemblies, model 64017 (NSN 4930-01-363-6449). POC: Mr. Gerold Chaklos, DSN 693-3833 (314-263-3833).

■ AMSAT-R-X, 071619Z Feb 97, subject: SOU ATCOM 97-03, technical, general, helicopter cargo slings and pendants. POC: Mr. Jerome C. Smith, DSN 693-1676 (314-263-1676).

## Tank-automotive and Armaments Command (TACOM)

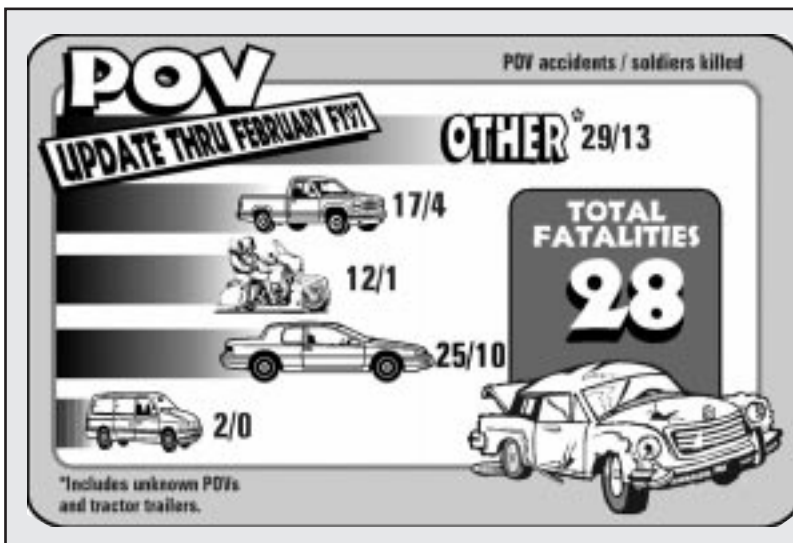
■ AMSTA-IM-O, 102131Z Jan 97, subject: SOU TACOM-WRN Control No. 97-04, limited operational, for M1 Abrams tank (NSN 2350-01-061-2445, LIN T13374), M1A1 Abrams tank (NSN 2350-01-087-1095) IPM1 Abrams tank (NSN 2350-01-136-8730) and M1A2 tank (NSN 2350-01-328-

5964). POC: Mr. Tim Milanov, DSN 786-7895 (810-574-7895).

■ AMSTA-IM-O, 142104Z Feb 97, subject: SOU TACOM-WRN Control No. 97-05, operational, water barrier swim system (12358415) for the Bradley Fighting Vehicle (BFVS) M2A2 (NSN 2350-01-248-7619, LIN F40375), M3A2 (NSN 2350-01-248-7620, LIN F60530), M2A0 (NSN 2350-01-048-5920, LIN J81750), M2A1 (NSN 2350-01-179-1027, LIN F40307), M2E1 (NSN 2350-01-200-3037, LIN F40307), M3 (NSN 2350-01-049-2695, LIN C76335), M3A1 (NSN 2350-01-179-1028, LIN F60462), M3E1 (NSN 2350-01-200-3038, LIN F60462), M2A20DS (NSN 2350-01-405-9886, LIN F40375) and M3A20DS (NSN 2350-01-405-9887, LIN F60530). POC: Mr. Peter Sturos, DSN 786-8948 (810-574-8948).

■ AMSTA-IM-HH, 071419Z Feb 97, subject: MAM TACOM-WRN Control No. 97-003, procedures for erecting the crane: M984A1 wrecker (NSN 2320-01-195-7641, LIN T63093), M977 cargo w/ winch (NSN 2320-01-097-0260, LIN T39518), M977 cargo wo/ winch (NSN 2320-01-099-6426, LIN T59278), M985 cargo w/ winch (NSN 2320-01-097-0261, LIN T39654), and M985 wo/ winch (NSN 2320-01-100-7673, LIN T39586). POCs: Mr. Jim Howard or Mr. Loren Schrader, DSN 786-5843/7438 (810-574-5843/7438).

■ AMSTA-IM-O, 121817Z Feb 97, subject: MAM TACOM-WRN Control No. 97-004, air induction system maintenance for Abrams tank systems: M1 (NSN 2350-01-061-2445, LIN T13374), IPM1 (NSN 2350-01-136-8730, LIN T13374), and M1A1 (NSN 2350-01-087-1095, LIN T13168). POCs: Mr. Brad Voss, DSN 786-7389 (810-574-7389) or Mr. Edward G. Feeley, DSN 786-6846 (810-574-6846).



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